BENCHMARKS

THE COMPUTING CENTER

University of North Texas

VOLUME 10 NUMBER 5

MAY/ JUNE 1989

Focus on Statistical Packages

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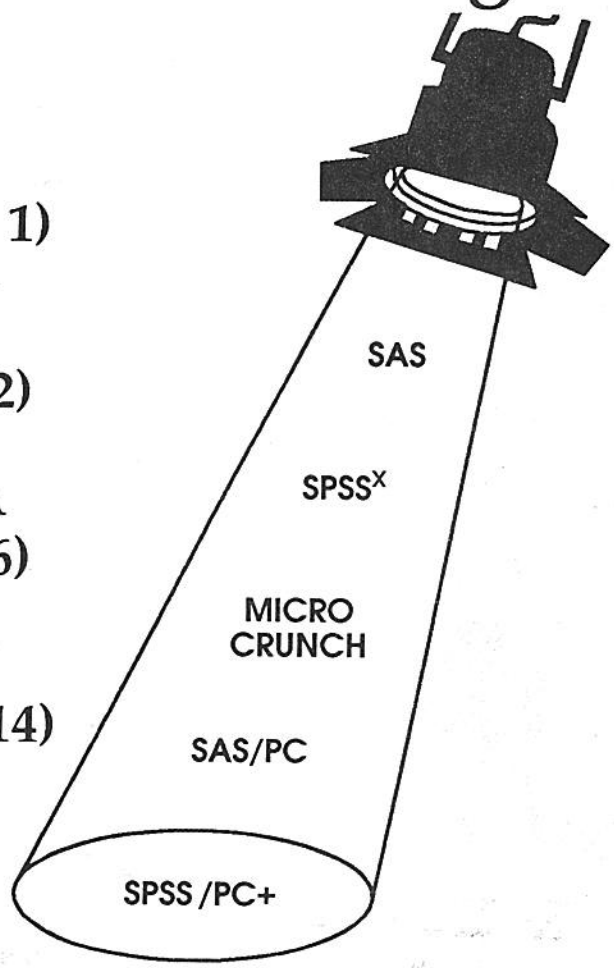

SERVICES AVAILABLE TO USERS OF THE UNT COMPUTING FACILITIES

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone Numbers:

Computing Center:	(817) 565-2324
HelpDesk:	(817) 565-4050
Micro Support:	(817) 565-2316, 565-2319
Graphics Lab:	(817) 565-3479
ISB I/O Area:	(817) 565-3890
BA I/O Area:	(817) 565-2350

All personnel listed below can be contacted either by calling the Computing Center or by sending them electronic mail on MUSIC/SP (ID-codes follow each name. All IDs are on BITNET node UNTMUSIC).

Benchmarks - Claudia Lynch (AS04)

Information & ID-Codes; Disk Space Problems - Marilyn Jett

Statistical/Research Support - George Morrow (AS01), Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

AcademicADABAS/COM-PLETE - Janis Burkham (AC55)

CRSP & COMPUSTAT Problems - Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Student Programming Problems - CSCI Dept., GAB Room 542A; BCIS Dept., BA Room 152

Problems with JCL, Passwords, or Operating Systems; or Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - ISB or BA I/O Operators

DIALING-UP UNT COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300/1200 BAUD:	(817) 565-3300, (817) 565-3499
300-9600 BAUD:	(817) 565-3461
300-9600 BAUD:	D/FW METRO 429-6006, 429-9314 Area code 214 must dial 817 before the METRO number.

The numbers that accomodate multiple baud rates have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

CALL 8040	connects with the NAS/8083 (supports line editing or PCWS). Operating environments available are: MUSIC/SP, VM/CMS.
CALL 3270	connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing). Operating environments are: MUSIC/SP, VM/CMS, ADABAS/COM-PLETE, PHOENIX
CALL DEC	connects with the VAXcluster (VMS, Eunice)
CALL 780	connects with the Research VAX (Unix)
CALL 3000	connects with the Libraries' HP-3000 (Bibliographic database).
CALL 6800	connects with the NBI (Unix)

Communications Settings

LAN addresses	Data Bits	Parity	Stop Bits
DEC, 3000	8	N	1
8040, 3270, 780, 6800	7	E	1

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : SUMMER1989*

Location	Days	Times
Computing Center RJE	Sunday Monday Tuesday-Saturday	Noon-Midnight 7 a.m.-Midnight 7 a.m., Tues.-Midnight Sat. (Open 24 hours/day)
ISB 110 Terminal Area	Sunday Monday-Thursday Friday Saturday	1-10 p.m. 7:30 a.m.-10 p.m. 7:30 a.m.-6 p.m. 9 a.m.-6 p.m.
College of Business	Saturday, Sunday Monday-Thursday Friday	Noon-11:45 p.m. 8:15 a.m.-11:45 p.m. 8:15 a.m.-7:45 p.m.
GAB 550C **Tenative Schedule**	Sunday Monday-Thursday Friday Saturday	2 p.m.-Midnight 8 a.m.-Midnight 8 a.m.-5 p.m. 2 p.m.-7 p.m.
Graphics Lab **Tenatuve Schedule**	Sunday Monday-Thursday Friday Saturday	Noon-10 p.m. 8 a.m.-11 p.m. 8 a.m.-6 p.m. Noon-5 p.m.

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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GENERAL INFORMATION

Desktop Laser Printing Available From ISB 110 Lab

Faculty , staff, and students can now achieve the high-quality output available from desktop laser printers without purchasing one of their own.Two desktop laser printers, an Apple Laserwriter II and an HP LaserJet II can be accessed from the microcomputers in the ISB 110 lab located in the the back of the first floor of the Information Science Library.

In order to recover the costs involved in making this service available, there will be a charge for sending output to these printers. The cost is ten cents per page, which must be paid when the output is picked up at the ISB I/O station.The method of payment is a Laser Printing Card , which can be purchased from the Union Information Desk, located on the third floor of the University Student Union (Inter-Departmental Orders are accepted in the Computing Center Offices - ISB 119). The Union information desk hours are 8 a.m. - 9 p.m., Monday through Saturday.

If you have any questions about laser printing from ISB 110, please contact the Help Desk (565-4050).§

Changes in Statistical Software

By Panu Sittiwong, Academic Computing Services Statistical Consultant (BITNET: AC09@UNTVM1)

We have been reviewing our current statistical software holdings and have identified several packages which we feel will be better utilized on other systems. We are adding modules to SAS/PC to better support researchers using that software, and we have also added modules to SPSS PC+. **If the changes in statistical software described below will have an adverse effect on your academic activities, please inform Academic Computing Services at 565-2324.** We are looking forward to work ing with you on your statistical software needs.

Statistical Software to be Dropped:

- BMDP for VAX/VMS - remains available on OS/MVS.
- SAS/OR for OS/MVS - remains available in SAS/PC.
- SAS/FSP for VM/CMS - remains available in SAS/PC.
- SPSS^X/Tables for OS/MVS - remains available in SPSS/PC+.

The following software remains available for fiscal year 1990, although the use of Minitab and IDA on MUSIC/SP are currently under review.

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Available Mainframe Statistical Software

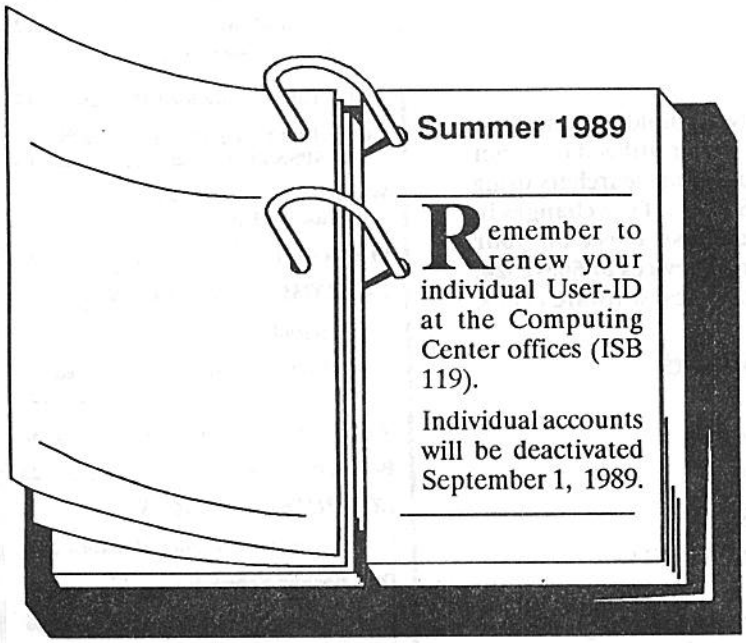
- BMDP for OS/MVS
- SAS for OS/MVS - includes Base SAS, STAT, ETS and IML
- SAS for VM/CMS - includes Base SAS, STAT and SAS GRAPH.
- SPSS^X for OS/MVS - includes Base SPSS^X, Advanced Stat and LISREL.
- Minitab for MUSIC/SP and VAX/VMS.
- IDA for MUSIC/SP.

Available Microcomputer Statistical Software

The University of North Texas has a site license which allows us to distribute SAS/PC, SPSS/PC+, and MICRO CRUNCH to faculty and staff members for use in University related activities. These packages may be installed on both University owned and personal PCs. A complete description of each package can be found in the Microcomputer section of this publication, page 14. If you think you want to have either SAS/PC or SPSS/PC+ installed on your microcomputer, please contact Academic Computing Services (565-2324). **Make sure that you have a minimum of 13 megabytes of hard disk space available.** If you would like a copy of MICRO CRUNCH, please bring two formatted 5 1/4" 360K floppy diskettes, or one formatted 3 1/2" diskette to the Computing Center Offices, ISB 119.

Following is a list of the modules available in SAS/PC and SPSS/PC+:

- SAS/PC Version 6.03 for IBM or Compatible PCs - Currently available modules include BASE, STAT, IML, and OR. The ETS, OR, GRAPH, and FSP modules will be available for the 1989 Fall semester.
- SPSS/PC+ Version 3.0 for IBM or Compativle PCs - Currently available modules include BASE, Advanced Stat, Tables, Graphics, and Trends. **It should be noted that SPSS/PC+ Graphics requires either Microsoft Chart, Chart-Master, or GrafTalk, which must be purchased separately by the individual researcher or his/her department. §**



New Version of SAS Available for Testing on OS/MVS

Version 5.18 of SAS is now available for testing on the academic OS/MVS system. SAS 5.18 will be in test status, probably until the end of the second summer session. At that time, if there are no major problems are encountered, it will replace SAS 5.16.

To execute SAS 5.18, change the EXEC line in your job stream so that it reads:

// EXEC SAS518

A manual, *Technical Report:P-175 - Changes and Enchancements to the SAS System, Release 5.18, under OS and CMS*, will be available at the University Store in the near future. It can also be ordered from SAS Institute INC. for $10.50. To order this manual, #C5959, call the SAS Institute Book Sales Department at (919) 467-8000 or write:

SAS Institute Inc.
Book Sales Department
SAS Circle, Box 8000
Cary, N. C. 27512-8000

Notable changes listed in this manual include:

BASE SAS:

- The special missing values A-Z in a transaction data set update the master data set to that special missing value.
- Using the LIBNAME statement to associate a libref with a SAS data library is documented.
- The definition of the SAVE statement in the DATASETS procedure has changed.

- The FORMAT procedure allows you to create user-written informats.
- The FREQ procedure accepts negative values of the WEIGHT variable
- The LOGLIN statement in the CATMOD procedure has been enhanced.
- Additional options are available for the TABLES statement in the FREQ procedure.
- Use of the BY statement in the NLIN procedure is documented.
- MODECLUS is a new procedure that clusters the observations in a SAS data set using any of several algorithims based on nonparametric density estimates.

ETS:

- Both the CITIBASE and the PDLREG procedures contain new options.

IML:

- New functions and graphics commands are available.
- The GTEXT, GVTEXT, GXAXIS, and GYAXIS commands have been enhanced.

SUGI Supplemental Library:

- Three new procedures have been added: HAZARD, HAZPRED, and QUANT1.
- The LOGIST procedure has been enhanced.
- The QPRINT procedure has been moved from base SAS software to the SUGI Supplemental Library and has been enhanced.
- The IDPLOT procedure has been moved to the SUGI Supplemental Library.

If you have any questions about SAS Version 5.18, or you want to look at *Technical Report:P-175* please contact Panu Sittiwong, Academic Computing Services 565-2324. §

ICPSR Summer Program in Quantitative Methods

By Panu Sittiwong, Academic Computing Statistical Consultant (BITNET: AC09@UNTVM1)

Each year the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan sponsors a summer program in quanitative methods. Since the University of North Texas is a member of the Consortium, graduate students and faculty members are eligible to attend the Summer Training Program. Graduate students can either take courses for credit or audit them. Faculty members will be considered Visiting Scholars.

This year, the summer program is offered from June 26 to August 18. This program will be divided into two sessions; the first of which starts on June 20 and ends July 21. The second session starts on July 24 and ends on August 18. Each session will have a series of lectures, workshops, and special one week workshops. The first session schedule includes:

Lectures:

- The Logic of Data Analysis: Measurement and Design.
- Basic Mathematics.
- Mathematics for Social Scientists.
- Introduction to Computing.
- Advanced topics in Social Research.

Workshops:

- Mathematical Models: Game Theory.
- Quantitative Historical Analysis.
- American Electoral Research.
- Latino Research Issues.
- Introduction to Statistics and Data Analysis I.
- Introduction to Regression Analysis.
- Linear Models.
- Multivariate Statistical Methods.
- Scaling and Dimensional Analysis.

Special Workshops:

- Survey of Income and Program Participation.
- National Health Interview Survey.
- Logit and Log-linear Models.
- Network Analysis.

The second session schedules include:

Lecture:

- Introduction to Computing.
- Formal Models of Social Systems
- Matrix Algebra, Probability, and Estimation.

- Advanced topics in Social Research.
- Dynamic and Longitudinal Analysis.

Workshops:

- LISREL Models.
- Linear Models.
- Time Series Analysis.
- Mathematical Models: Rational choice.
- Quantitative Analysis of Crime and Criminal Justice.
- Introduction to Statistics and Data Analysis II.
- Categorical Data Analysis.
- Structural Equation Models.
- Advanced Analysis of Variance.

Special Workshops:

- LISREL Models: Introduction.
- LISREL Models: Intermediate.
- Regression Diagnostics.

For more information contact either Dr. Rick Cupit, who is the official UNT ICPSR representative, at (817) 565-2276 or Panu Sittiwong at (817) 565-2324.§

Requests for Classroom User-IDs Should be Made A.S.A.P

All faculty members who will need User-IDs for their classes during the summer should fill out a **blue** *F-020-01 Computing Center New USER-ID Request Form*. It is important to indicate that your class will be meeting both Summer I and II terms, if that is the case. Additionally, a **white** *Classroom ID Usage Projection* form should also be completed.

The above mentioned forms can be obtained from the Computing Center offices, ISB 119. Assistance in completing these forms is also available in ISB 119.§

1989 Summer Short Course Offerings

The Computing Center is offering the following short courses for Summer 1989. Please pre-register to attend (a registration form can be found at the end of this issue). **A maximum of 10 people will be admitted to each of the courses held in ISB 110. A maximum of 8 people will be admitted to each of the courses held in ISB 123.**

1. **Introduction to MUSIC/SP, Part I** – MUSIC/SP is the primary interacve operating system employed by most academic users to access the NAS/8083 IBM-compatible mainframe computer at UNT. MUSIC users have access to a variety of programming languages, a sophisticated word processing system, and several statistical analysis packages. MUSIC also gives you the capability to submit batch jobs to the MVS operating system. Topics covered include gaining access over the Local Area Network, logging on and off, changing your password, and creating, editing, and storing files using the full-screen editor.

   Introductory sessions to MUSIC/SP, Part I will be held in Room 110 of the Science Library (ISB) on a weekly basis through March. **NO PRE-REGISTRATION IS REQUIRED FOR THESE COURSES.** A schedule of remaining courses is printed below. Consult the HELP DESK (565-4050) for any changes and/or additions that may have taken place. All courses will be taught by Help Desk staff.

   - Wednesday, June 7: 9-11 a.m.
   - Monday, June 12: 1-3 p.m.
   - Thursday, June 15: 10 a.m.-Noon

2. **Introduction to MUSIC/SP, Part II** – This course provides an in-depth look at various useful programs and utilities that are available on MUSIC/SP. Topics covered include accessing on-line help facilities, using electronic mail, routing output to high-speed printers, and writing files to secondary storage such as disk and tape. **A working knowledge of MUSIC is required.**

   A separate two-hour session to be held in Room 110 of the Science Library (ISB):

   - Friday, June 30: 3-5 p.m.
     Instructor: Philip Baczewski

3. **Introduction to IBM Job Control Language (JCL)** –This course provides an overview of IBM JCL for users who wish to further their knowledge in this area. It is useful to individuals who plan to run batch jobs (e.g. SAS, SPSS^X, BMDP) on the IBM-compatible mainframe computer.

   A separate two-hour session to be held in the Academic Computing Conference Room (ISB 123):

   - Thursday, June 30: 3:30-5:30 p.m.
     Instructor: Janis Burkham

4. **Introduction to SAS** – SAS is one of the most widely implemented data analysis systems within business and education. SAS is particularly well suited for dataset manipulation and includes an extensive procedure library providing a wide range of analytical tools. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SAS, simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

   A separate two-hour session to be held in Room 110 of the Science Library (ISB):

- Thursday, June 15: 6:30-8:30 p.m.
  Instructor: Phanit Laosirirat

5. **Introduction to SPSS^X** – SPSS^X is the latest version of this popular data analysis system originally developed for social scientific research. While SAS is slightly more powerful for the analysis of complex datasets, many users find SPSS^X to be easier to learn. SPSS^X also includes more flexible facilities for collapsing and labeling variables. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SPSS^X simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

   A separate two-hour session to be held in Room 110 of the Science Library (ISB):

   - Monday, June 19: 3:30-5:30 p.m.
     Instructor: Panu Sittiwong

6. **Introduction to VAX/VMS, Part I** – VMS is the interactive operating system used on the Digital Equipment Corporation (DEC) VAXcluster. Nearly all popular programming languages are supported under VMS. The topics covered in this course include gaining access to the VAXcluster through the Local Area Network, logging in and out, changing your password, creating files and directories, creating login command files, using the EDT editor, and defining logicals and symbols.

   Introductory sessions to VAX/VMS, Part I will be held in Room 110 of the Science Library (ISB) on a monthly basis beginning through March. **NO PRE-REGISTRATION IS REQUIRED FOR THESE COURSES.** A schedule of the remaining courses is printed below. Consult the HELP DESK (565-4050) for any changes and/or additions that may have taken place. All courses will be taught by Help Desk staff.

   - Thursday, June 8: 1-3 p.m.

7. **Introduction to BITNET** – BITNET is a network linking more than 600 computers at over 300 institutions and research centers. This course covers the basic concepts of BITNET, file transfers across BITNET sites, and other services that are available on this computer network. Faculty and graduate students needing to exchange information with other universities and research institutions in the U.S., Canada, Europe, or Japan will benefit greatly from attending this course. **Prior knowledge of at least one of the following interactive operating systems is required: CMS, MUSIC, VAX/VMS.**

   A two-hour session to be held in the Academic Computing Conference Roon (ISB 123):

   - Tuesday, June 13: 3:30-5:30 p.m.
     Instructor: Philip Baczewski

8. **Introduction to ARPA Internet and THENET** - the ARPA Internet is a collection of related computer networks that link thousands of computers throughout the world. THENET is a network that connects 35 universities, research institutions, and state agencies in the state of Texas. This course covers the basic concepts, file transfer, remote login, and other services available on the networks. Faculty and students needing to exchange information with other universities, government agencies, companies and research institutions, or between the various machines on the University of North Texas campus would benefit from this course. **Prior knowledge of at least one of the following interactive operating systems is required: VAX/VMS, Unix, MS-DOS.**

   A separate two-hour session to be held in the Academic Computing Conference Roon (ISB 123):

   - Friday, June 16: 3-5 p.m.
     Instructor: Billy Barron
   - Wednesday, July 12: 3:30-5:30 p.m.
     Instructor: Billy Barron

9. **Introduction to PCWS and Introduction to Procomm** are two short courses that deal with Personal Computer to mainframe communications. **Introduction to PCWS** presents an overview of using PC Work Station, a communications package which is specifically written to allow terminal access and file transfer capabilities between an IBM PC or compatible and the MUSIC/SP operating system. Topics covered will include setting up PCWS communications parameters, connecting to MUSIC over the UNT local area network, using PCWS's full-screen capabilities, and using PCWS for file transfer between MUSIC and the PC. **Introduction to Procomm** presents an overview of the Procomm communications package for Personal Computers or compatibles. Procomm provides several different terminal emulation modes, and supports several file transfer protocols including KERMIT and XMODEM. Topics covered include setting communications and file transfer parameters, setting up and using Procomm's dialing directory, and connecting to UNT mainframes through the local area network. Another communications package, **Kermit**, will also be discussed at the end of each PCWS session.

   Two separate one-hour sessions to be held in the Academic Computing Conference Room (ISB 123):

   - **Introduction to Procomm:**
     Wednesday, June 7: 3:30-4 p.m.
     Instructor: Kevin Mullet
   - **Introduction to PCWS:**
     Wednesday, June 7: 4:30-5:30 p.m.
     Instructor: Kevin Mullet
   - **Introduction to Procomm:**
     Thursday, July 13: 3:30-4:30 p.m.
     Instructor: Kevin Mullet
   - **Introduction to PCWS:**
     Thursday, July 13: 3:30-4:30 p.m.
     Instructor: Kevin Mullet

Circumventing a SAS GRAPH Quirk

By Nancy Rowe, University of Texas at Arlington [Taken from the *LINK*, the Univeristy of Texas at Arlington Computing Center Newsletter, Spring '89 issue.]

When you use PROC Gplot with the PLOT subcommand and the OVERLAY option to graph several curves on the same coordinate system, it may be desirable to be able to create a legend to explain the graph. However, in this situation, the LEGEND option does not work. Thus, we are presented with the problem of creating our own legend. This can be accomplished by using the ANNOTATE command. This involves creating a data set which consits of functions, symbols, and descriptions which define the legend, as well as specifying the positions they will occupy on the graph. The following example will illustrate this process.

```
DATA LEG;
   LENGTH FUNCTION $ 8. COLOR $ 8.;
   FUNCTION='MOVE'; X=48; Y=60; OUTPUT;
   FUNCTION='DRAW'; X=54; Y=60; COLOR='BLACK'; LINE=1;
   OUTPUT;
   FUNCTION='LABEL'; X=61; Y=60; TEXT='SUPPLY'; OUTPUT;
   FUNCTION='MOVE'; X=48; Y=58; OUTPUT;
   FUNCTION='DRAW'; X=54; Y=58; COLOR='BLACK'; LINE=2;
   OUTPUT;
   FUNCTION='LABEL'; X=61; Y=58; TEXT='DEMAND'; OUTPUT;
DATA ATOM;
INPUT X Y Z W;
CARDS;
18.03 7.61 19.66 7.61
16.05 7.32 5.80 7.32
15.00 5.33 12.73 5.33
15.00 3.53 12.73 3.53
11.03 2.59 12.73 2.59
10.03 1.09 25.46 1.09
5.00 0.00 0.00 0.00
;
SYMBOL1 W=1 C=BLACK I=JOIN L=1 V=STAR;
SYMBOL2 W=2 C=BLACK I=JOIN L=2 V=SQUARE;
PROC GPLOT;
   PLOT X*Y=1 Z*W=2 /OVERLAY ANNOTATE=LEG;
```

In the program above, the dataset LEG consists of the specifications for the legend. The first 'MOVE' function positions the plotter pen at coordinates (48,60). (These are not coordinates relative to the axes for your graph, but are screen cell values. Therefore, it may take a little experimentation and practice to get your legends where you want them.) The first 'DRAW' function indicates that a line should be drawn from the current pen position, (48,60), to the position specified by the coordinates (54,60). The color of the line should be black, and the line type should be '1', that is a solid line. The 'LABEL' function indicates that the word 'SUPPLY' should be written on the graph starting in positon (61,60). The rest of LEG is explained similarly. To attach the legend to the plot, use the option ANNOTATE=LEG as shown in the last line of the above example. §

Using the SPSS^X MANOVA Procedure

By Scott Barber, Former Academic Computing Services Consultant

One of the statistical tools used frequently at UNT is multivariate analysis of variance (MANOVA). here are MANOVA procedures provided by SPSS^X, SAS, and BMDP, but this article will deal primarily with the SPSS^X MANOVA procedure. I hope to clarify some of the problems which are commonly experienced, and furnish some guidelines with which to proceed when using this tool to explore your data. MANOVA analyzes differences in the means of multiple interval-level dependent variables. Its purpose is to explain differences on these variables across categorical "groups" or across the values of one or more interval-level "covariates". The specification of the MANOVA subcommands can be cumbersome if you aren't sure just what output you need. ("My professor said to do a MANOVA with these variables; what do I do?") To begin with, you should prepare your list of variables you want to analyze and organize them in the initial MANOVA command line.

Getting Started

A common MANOVA design could include the following: three dependent variables, one for each of three interrelated test results (e.g. RESULT1, RESULT2, and RESULT3); two "factor" or "group" variables, one with two levels (e.g. SEX) and one with four (e.g. METHOD), and an intervel level covariate (e.g. AGE). The first couple of lines of MANOVA code are easy enough to prepare. The syntax is:

MANOVA dependent varlist [**BY** factor list (min,max) [factor list...]]

(Parameters within brackets [ ] are optional; bold, capitalized words should just as they appear here.)

Using our example, the initial MANOVA command line would look like this:

MANOVA RESULT1 TO RESULT3 BY SEX(1,2) METHOD(1,4) WITH AGE

For this model, the RESULT variables are assumed to be interval level, sex and method are categorical (nominal), and age (used here as a covariate) is also interval level. Here, the effect of age on the RESULT scores is accounted for before the grouping variables are used to partition any variance.

When You Assume...

Unfortunately, when we assume that its okay if our data don't meet the assumptions of the analytical tool, we can be easily made statistical "fools" (your children may read this...) by reporting seemingly significant probability levels as valid. Your first analyses, then, will involve some preliminary examination of the variables with which you are working to see if the assumptions for the procedure are adequately met. If they aren't, then another procedure would be more appropriate for your data. You will use the /PRINT subcommand under MANOVA to regulate the type and amount of output generated. A couple of other assumptions involved include a multivariate normal distribution of the dependent variables, and homogenous variance-covariance matrices for each level of the grouping variables. SPSS^X offers several plotting procedures to examine the distribution of each of the dependent variables for normality. These plots are obtained by specifying the **/PLOT=NORMAL** subcommand. There is not a comprehensive test for multivariate normality within SPSS^X, but the rejection of the normality of any of the dependent variables would also constitute a rejection of multivariate normality.

Of course, in order for any of the normality assumptions to make any sense, you must make reasonable efforts to assure that your dependent variables (and any variables you are using as covariates) are interval level. Beware of using ordinal variables such as individual 7- or 10-point scale item scores as dependent variables in a MANOVA. A commonly used solution to this problem (although the result is not truly an interval-level variable) is to COMPUTE a new variable comprised of several of these items added together. As long as this new variable represents a (theoretically intelligible) construct composed of these items, and the variable meets the assumptions already mentioned, it will serve your purposes without perpetrating a "major" violation.

Unfortunately, when we assume that its okay if our data don't meet the assumptions of the analytical tool, we can be easily made statistical "fools" by reporting seemingly significant probability levels as valid.

There are also tests for the "homogenous dispersion matrices across groups" assumption, both for each dependent variable separately (Cochran's C and Bartlett-Box F) and for the variance-covariance matrix as a whole (Box's M). Access these tests by specifying:

/PRINT=HOMOGENEITY (COCHRAN BARTLETT BOXM)

Probability levels on these tests less than .05 imply rejection of the homogeneity assumption.

Note: Use of a second PRINT subcommand will override the first one, so always include multiple PRINT parameters with the same PRINT subcommand.

Looking for Significance

After ensuring that your data meet the "minimum guidelines" for the analysis, you can now begin to examine the data to see if the values differ across groups, or if most of the variance in the dependent variables is explained by covariates. The initial variable list provides the model which MANOVA will analyze, but this can be changed so as to analyze more than one model with one MANOVA specification. The /ANALYSIS subcommand can be used to exchange dependent variables with covariates, or delete dependent variables orcovariates. For example, we could change the form of the design by inserting the following specification:

/ANALYSIS RESULT2 RESULT3 WITH AGE

Similarly, the /DESIGN subcommand can be used to specify the structure of the model by adding or eliminating interaction terms, etc. The /DESIGN subcommand must always follow all subcommands for a given model. A /DESIGN subcommand without a listing of factors or interactions will result in a full-factorial model with all main effects and all possible interactions included.

Repeated Measures Analysis

I have been discussing the use of the MANOVA procedure with SPSS^X to explore the relationships among

multiple dependent variables. This time, we will look at a more specialized case of MANOVA, in which there are multiple measurements of a construct for each subject or respondent.

When to Conduct Repeated Measures Analysis

In order for repeated measures to be appropriate, the researcher should have measurements of a construct which are over time or under different circumstances or treatments, such as multiple measures of heart rate after various physical exercises, or some type of performance tests measured after differing training sessions.

They can also involve different measures of an underlying construct (such as different measures of well-being) measured at the same time. The key is that the various dependent measures must be "qualitatively" similar, or else there is no reason to do the multivariate analysis in the first place.

Determining the relevance of a repeated measures design also involves the idea of having hypotheses concerning the levels of the repeated or "within-subjects" factor(s). If there are no within-subjects hypotheses, then a standard MANOVA will suffice.

Essentially, a repeated measures MANOVA is a regular MANOVA on transformed linear combinations of the variables defining the repeated measures factor.

What Happens...

The ANALYSIS(REPEATED) command can automatically generate an "orthonormalized" transformation matrix, causing the analysis to be performed on the transformed variables. The benefit of having this matrix be orthonormal is that all of the univariate tests will be independent. You can also disregard the ANALYSIS(REPEATED) command and define your own transformations, but you must proceed with caution, because the univariate tests are not then protected against multiple comparisons.

Regardless of the type of transformation used, you always end up with one less transformed variable than original variables. One of these will represent the null hypothesis that the means of all the dependent variables are equal (across the between subjects factors, if there are any). The others combine to produce the multivariate tests of the "within-subjects" factor(s).

Advantages of Repeated Measures Analysis

There are two major advantages to using a multivariate repeated measures test. The first is the ability to deal with fundamentally repeated measures data without making the rather restrictive assumption that the covariance matrix of the dependent variables follows a 'Type-H' pattern. (This has also been referred to as 'circularity,' and 'uniform-ness', and is called 'sphericity' by SPSS.) On the other hand, the multivariate tests assume that when there are two or more groups (between-subjects factors), the variance-covariance matrices from each group are homogenous.

If you are interested in examining univariate differences, then the sphericity assumption comes into play again (see the previous page for tests of this assumption), but refers to the transformed variables rather than the originals. The transformed variables must also have homogeneous covariance matrices across groups. Otherwise, the univariate F ratios will be too liberal. (If the sphericity assumption is not met, there are adjustments which can be made to the degrees of freedom to result in a more realistic univariate F statistic.)

The second major advantage of the multivariate repeated measures approach is that there is a built in control for individual differences which can increase the power of the multivariate test. While dropping the sphericity assumption (and doing a multivariate test as opposed to a univariate one) will generally lead to a loss of power, reduction of error variance due to individual differences helps to focus statistical attention on the hypothesized affects.

The MANOVA Procedure

As mentioned earlier, repeated measures can be specified by using the ANALYSIS(REPEATED) subcommand (along with the WSFACTOR and WSDESIGN subcommands) within MANOVA. These subcommands produce orthonormal transformations of the dependent variables corresponding to the within-subjects hypotheses. (See Section 33.76, pp. 622-629 in the *SPSS^X User's Guide*, 3rd Edition for an example of the basic setup for a repeated measures analysis.)

To specify alternative transformations to test specific hypotheses con-

Baczewski Composition Performed

DUO for Violin and Viola, a composition by Philip Baczewski - Associate Editor of *Benchmarks*, was performed on a concert of music by Southwest Composers, at the annual conference of the College Music Society, South Central Chapter, April 7, 1989 at Trinity University in San Antonio.

cerning the within-subjects factors(s), use the CONTRAST subcommand. For example, you can easily specify POLYNOMIAL (linear, quadratic, cubic, etc.), REPEATED (adjacent levels), DEVIATION (each original variable vs. the grand mean), and several other types of contrasts.

If the transformation matrix is orthonormal, then the univariate tests will be independent and the averaged F test will be valid. SPSS^X will orthonormalize such contrasts as SIMPLE, DIFFERENCE and DEVIATION before the analysis, so you usually don't have to worry about it. However, be careful if you are constructing SPECIAL contrasts, such as for a profile analysis because there is no protection from multiple comparisons from an inflated alpha level.

One of the tricky aspects of reading the output from the SPSS^X repeated measures MANOVA is the identification of effects. The multivariate tests are easy enough to identify, but the univariate tests will be labeled according to the original variable names. However, these tests now correspond to transformed variables. Therefore, examination of the transformation matrix (with the PRINT TRANSFORM subcommand) will help you identify the labels associated with the univariate tests.

Final Comments

In many cases, the actual statistical tests of the univariate and multivariate approaches will be the same. Use of the multivariate and/or univariate tests depend most heavily on the hypotheses of interest and the assumptions involved. Care in interpreting the results is essential with both of these procedures. Be aware that violation of the assumption of multivariate normality results in an inflation significance level of the multivariate tests.

On the other hand, violation of the sphericity assumption with two or more groups can result in "vastly distorted" significance levels of univariate tests. To make matters worse, the test for sphericity has been reported to be very sensitive to violations of multivariate normality!

The issue of the power of the two tests in not completely straightforward, either. If the assumptions of the univariate tests are met, they will often result in a stronger test, but in certain situations (such as single group designs), the multivariate test will discern effects which would not show up with the univariate tests, because they average to zero over subjects.

Use of the HOMOGENEITY tests, therefore, along with plots to test for normality should be a standard practice to justify the use of these tests, and sphericity tests such as that proposed by Bartlett and the max F criterion should be examined before proceeding with interpretation of univariate and multivariate results. Although they are not foolproof, they will help provide some protection against making potentially misleading conclusions.

For further detail on repeated measures analysis consult:

Barcikowski, R. S. [ed.] (1983) *Computer Packages and Research Design with Annotations of Input and Output from the BMDP, SAS, SPSS, and SPSS^X Statistical Packages*. Washington, DC: University Press of America.

Cole, J.W.L. and James E. Grizzle. "Applications of Multivariate Analysis of Variance to Repeated Measurements Experiments," *Biometrics*.

SPSS^X User's Guide, 3rd ed. (1988). SPSS, Inc. McGraw-Hill.

Norusis, Marija. (1985) *SPSS^X Advanced Statistics Guide* Chicago, IL: McGraw-Hill.

This article has been reprinted, with minor revisions, from the April 1987 and the August/September 1987 issues of *Benchmarks*,

Exporting Data and Programs From SPSS^X to SPSS/PC+

By Panu Sittiwong, Academic Computing Statistical Consultant (BITNET: AC09@UNTVM1)

SPSS/PC+ and SPSS^X are not entirely compatible, despite the fact that they function very similarly. Two major incompatibilities involve the command syntax and system datasets. SPSS^X programs and system datasets can not be directly used with SPSS/PC+. SPSS^X, however, has procedures to convert both commands and datasets to and from SPSS/PC+. This article will present the setup for both tasks.

Exporting SPSS^X Program Files

The following program will translate an SPSS^X command file into an SPSS/PC+ command file.

```
/INC OSJE
SYSTEM='OS',RETURN
//idnnTRAN JOB (idnn,:10,1,9999),'Your Name',PASSWORD=mvspw
//   EXEC SPSSX
//SYSIN DD DSN=SYS2.SPSSX2.PCTRANS.FILES(XTOPC),
//              DISP=SHR,UNIT=SYSDA
//NEW   DD SYSOUT=B
//OLD   DD DATA,DLM='$%'
   Your SPSS^X program goes here
$%
```

Where: **idnn** is your MUSIC/SP id;
mvspw is your BATCH Password

If you want to translate SPSS/PC+ files to SPSS^X file, you will change the **XTOPC** parameter to **PCTOX**.

Exporting SPSS^X Data to SPSS/PC+

In most cases, however, exporting SPSS^X system data is more convenient. Exported data will have the same characteristics as SPSS^X system files. That is, it contains all the information including transformed variables, value labels, and variable labels. The following example shows the set-up necessary for exporting data from SPSS^X to SPSS/PC+.

```
/INC OSJR
SYSTEM='OS',RETURN
//idnnTRAN JOB (idnn,:10,1,9999),'Your Name',PASSWORD=mvspw
//   EXEC SPSSX
//DATAINDD DSN=USER.idnn.mydata.spssxfil,DISP=SHR,
// VOL=SER=ACADnn,UNIT=SYSDA
//TOPCDD SYSOUT=B,(BLKSIZE=80,LRECL=80)
GET FILE = DATAIN
EXPORT OUTFILE = TOPC
  /KEEP = ID NAME WEIGHT HEIGHT ....
  /DIGITS = 2
FINISH
```

Where: **idnn** is your MUSIC/SP id;
mvspw is your BATCH Password;
mydata.spssxfil is your dataset name;
ACADnn is either ACAD00, ACAD01, ACAD02, or ACAD03.

Saving Export Files to MUSIC/SP Files

After either of the above programs have been executed, you will have to save the program or export data to a MUSIC/SP file via the OSJR command. To enter OSJR from MUSIC/SP *GO mode, type **OSJR**. After your job has been executed, you will have a punch dataset.

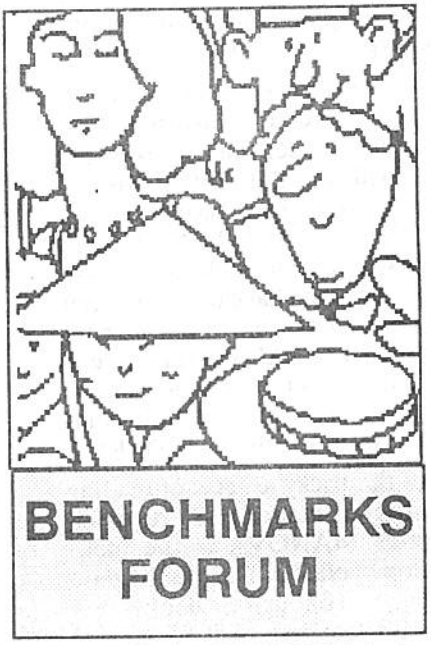
To determine your job status, while in OSJR, simply hit the <RETURN> or <ENTER> key. The system will respond with one of the following messages:

JOB nnn idnnTRAN WAITING TO BE RUN
JOB nnn idnnTRAN RUNNING
JOB nnn idnnTRAN OUTPUT READY FOR MUSIC - 350 LINES

Once you see that your job is ready for MUSIC, you can check whether the job has been scuccessfully executed by entering **OUT J=nnn** (where **nnn** is your job number shown in OSJR) at the "ENTER REQUEST" prompt.

If your job executed properly, you will see the message **PUNCH DSIDS: 5(nnnn)**. To save the punch dataset to a MUSIC file, enter **OUT J=nnn,D=PUN,FILE=music.filename** at the "ENTER REQUEST" prompt (**music.filename** can be any name you want, following the MUSIC file naming conventions).

When the output is successfully saved as MUSIC file, the system will respond with **OUTPUT COPIED**. You then can exit OSJR by typing the command **END**. The MUSIC output file, then, can be downloaded to your PC by any communication software including PCWS, PROCOMM, and MS-KERMIT. For assistance in downloading a file, call the Help Desk at (817) 565-4050 or come to room 110 of the Information Science Library during the library hours.§



BENCHMARKS FORUM *is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the* ***Benchmarks*** *editor* (AS04@UNTVM1) *or write it down and drop it by the Computing Center. We will try to answer it in the next issue.*

Question: *When I use PROC GLM in SAS to perform an analysis of variance, I get two types of sums of squares: Type I and Type III. What is the difference between these types? Which one should I report?*

Answer: Type I sums of squares (SS) are incremental sums of squares. The order the effects are listed on the MODEL statement is the order in which they are entered into the analysis. Each effect is adjusted only for the preceding effects in the model. Therefore, when there is an unequal number of observations in the groups (unbalanced data), the Type I SS differ, depending

upon the order that the effects are listed on the MODEL statement. For example, given the MODEL statement:

MODEL Y = A B A*B;

the A main effect is confounded with the B main effect and the A*B interaction. The B main effect is adjusted for the A main effect but is confounded with the A*B interaction. The A*B interaction is adjusted for both the A and the B main effects. If the order of the MODEL statement is changed to the following:

MODEL Y =B A A*B;

then the B main effect is confounded with the A main effect and the A*B interaction. The A main effect is adjusted for the B main effect but is confounded with the A*B interaction. The A*B interaction is adjusted for both the A and the B main effects. If the data are unbalanced, the resulting Type I SS for the A and B main effects will be different if the first MODEL statement is used instead of the second MODEL statement.

Therefore, TYPE I SS are not recommended for unbalanced analysis of variance (ANOVA) models. Type I SS are considered appropriate for balanced ANOVA models specified in the proper order. The proper order is main effects followed by interactions. Lower-order interactions precede higher-order interactions.

Type III sums of squares (SS) are partial sums of squares. Type III SS are constructed such that an effect is orthogonal to any other effect specified in the MODEL statement. Therefore, Type III SS for an effect are not confounded with any of the other effects. Type III SS for an effect are the sums of squares that would have occurred if that effect had been entered last in the model. Therefore, Type III SS are not order dependent. For example, given either of the following MODEL statements:

MODEL Y = A B A*B;

MODEL Y = B A A*B;

Continued ... see FORUM page 13.

THE BITNET CONNECTION

By Philip Baczewski, BITNET INFOREP(BITNET: AC12@UNTVM1)

*This Column is a continuing feature of **Benchmarks** intended to present news and information on various aspects of the BITNET wide area network.*

Getting on the LISTs

In recent years, the words "mailing list" have taken on a most negative connotation in relation to the U.S. mails. Trips to the mail box can be heard to produce exclamations like, "Oh no, three sweepstakes entries telling me I've already won 10 million dollars; five letters informing me that I have definitely been awarded a new car, a power boat, a Caribbean cruise, cash - cash - cash, a diamond ring, and all I need to do to claim these prizes is to come and see the luxury lake-side lots in beautiful Slug Trail Texas; eight catalogues, from which I can purchase fig pitters, car antenna waxers, a 'special Delaware-shaped commemorative plate,' and 'all the reading material your pet will ever need;' oh ,and my thirteen credit card bills." (Trips to the mail box can sometimes be overwhelming.)

Unlike their surface mail counterparts, wide area network mailing lists carry quite positive connotations. Mailing lists allow you to establish communications with groups of people in the U.S. and around the world who share your same interest in a particular subject. Mailing lists can ensure the delivery of electronic magazines and other materials on general or special topics. Best of all, you choose the network mailing lists on which you will be included. Like their surface mail counterparts, however, network mailing lists can make trips to your electronic mail box rather overwhelming if the selection and use of those lists is not well managed. Included here are a few tips which will, hopefully, make your use of mailing lists as effective and enjoyable as possible.

Perhaps the first question about mailing lists is "how do I find out what's out there." Academic Computing Services maintains several on-line files containing information on mailing lists and how to access them. **BITNET.SERVERS**, a public file on MUSIC, and **SYS$BITNET:BITNET.SERVERS**, on the VAX, contains information on various BITNET services including descriptions of electronic magazines and a listing of all LISTSERV installations (LISTSERV is a specialized mailing list program which runs at many sites on BITNET). The file **LISTSERV.GROUPS** (public on MUSIC and **DUA1:[PUBLIC.NETWORKS.BITNET.LISTSERV]LISTSERV.GROUPS** on the VAX) contains a description of most of the BITNET LISTSERV special interest group (SIG) mailing lists and all of the ARPANET mailing lists that have BITNET sub-lists, with instructions on how to subscribe to those lists.

The file **SYS$NETINFO:MAILING_LISTS.DOC** on the VAX contains a listing of all ARPANET SIG lists as well as the BITNET lists. In addition to the above documentation, you can find out the mailing lists maintained at any BITNET LISTSERV site by sending that LISTSERV installation the LIST command. There is much information available about mailing lists - so much so, that maybe some suggestions for going about the gathering of that information are in order.

When you scan the file **LISTSERV.GROUPS** or **MAILING_LISTS.DOC** for topics that are of interest to you, if you find a topic, make note of the following information:

- **Subscription address** - in the case of BITNET's LISTSERV facilities, subscription commands can be sent to the particular LISTSERV installation that maintains the list;
- **List format** - some mailing lists "broadcast" all messages sent to it, while on others, a list moderator places the messages into digest form before they are sent to you. Digest mailing lists usually generate much less mail traffic than their "undigested" counterparts;
- **List distribution** - In **LISTSERV.GROUPS**, one piece of information available is the various LISTSERVs at which a particular list is maintained. In general, the more sites at which a list is maintained, the more popular that list is, and therefore, the more mail traffic it will generate.
- **List moderator** - Most list descriptions include the name of the moderator and the moderator's network mailing address. Whether you subscribe to a list or not, the moderator can sometimes be helpful in providing additional information about that list, or suggesting alternate sources of information.

Once you absorb the above information, accessing network mailing lists can be quite simple. You may find, however, that managing all the mail generated from those lists can get to be a bit complex. Whenever possible, you should take advantage of the new VAX program **ANUNEWS** (see related article in the VAX section of this newsletter), which maintains subscriptions to many mailing lists. From ANUNEWS, you can read and reply to these messages as if you had your own subscription. If you do subscribe to mailing lists individually, the following guidelines may be helpful for managing your list mail.

- **Limit your subscriptions** - two or three active lists may generate as much information as you can easily assimilate. Limit your subscriptions to those lists which provide you the best information on your topics of most interest.
- **Read your mail often** - Mailing lists generate a continual stream of messages. If you don't read them often, they just stack up and occupy valuable system storage space. On most lists, mail is of immediate topical interest, and like leftovers in the refrigerator, may soon become quite useless (if not unappetizing) if left unassimilated.
- **Unsubscribe when you will be away** - If you will be away from your network access and can't read your mail for even as little as a week, it is a good idea to sign off from your mailing lists. (**Remember** that all BITNET LISTSERV subscription and sign-off commands should be sent to a LISTSERV, i.e. **LISTSERV@*nodename***, rather than the list, i.e. ***listname@nodename***). A week's worth of messages from an active list may continually keep you in "catch-up" mode.

Electronic mailing lists make frequent and speedy communication possible in a way which would not be available through surface mail. (Can you imagine your postman carrying that much mail and delivering it any time of the day that it is received?) Efficient management of list mail can make your use of that resource more effective. And happily, since junk mail is prohibited on BITNET, you won't receive even one invitation to visit Slug Trail Texas (oh, unless it's from a friend of yours who just happens to live there). §

LIST of the Month

Each month we will highlight one of the BITNET LISTSERV Special Interest Group (SIG) mailing lists. This month's list...

SPSSX-L@UGA

SPSSX-L Discussion: A forum for discussing usage, problems, and applications. The SPSSX-L discussion is available through **ANUNEWS** on the VAX (see related article in the VAX section of this newsletter) or by sending the message: **LISTSERV@UGA.SUBSCRIBE SPSSX-L *Your Name*** (**SUBSCRIBE** etc. should be the first line in a MAIL file). SPSSX-L is distributed across 5 LISTSERVs, however requests will be forwarded to the server closest your site.

SPSSX-L may be of interest to you if you make heavy use of the SPSS^X statistical analysis language. This very active list will generate many mail messages, but could provide you with just the insight needed to make your use of SPSS^X much easier.

FORUM continued from page 10 ...

the main effect is adjusted for both the B main effect and the A*B interaction. The B main effect is adjusted for the A main effect and the A*B interaction. The A*B interaction is adjusted for both the A and B main effects. If the data are unbalanced, the resulting Type III SS for the A and B main effects will be the same whether the first MODEL statement is used or the second MODEL statement.

Therefore, Type III SS are appropriate for unbalanced ANOVA models as well as balanced ANOVA models. Since the Type III SS for an effect are unconfounded with any of the other effects, statisticians prefer them to Type I SS. Therefore, it is recommended that you report the Type III SS.

Question: *I have performed an analysis of variance on some data, and the results show significant effects. Now I want post hoc comparisons. How do I get them using SAS on the mainframe system?*

Answer: If you have balanced data - the same number of observations in each group - then the MEANS statement in PROC ANOVA is the appropriate command to use to request post hoc comparisons. The syntax of the MEANS statement is: **MEANS** ***effects /options*****;**

To request a post hoc comparison be made on the effects, specify the appropriate option. These post hoc tests are available:

Bonferroni's t test.	Duncan's multiple-range test.
Gabriel's multiple-comparison procedure.	Ryan-Eliot-Gabriel-Welsch multiple F test.
Ryan-Eliot Gabriel-Welsch multiple-range test.	Scheffe's multiple-comparison procedure.
Sidak's inequality adjustment on pairwise t tests.	parwise comparions using studentized maximum modulus.
Student-Newman-Keuls multiple range test.	Tukey's studentized range test (honestly-significant-difference test).
pairwise t tests (Fisher's least- significant-difference test).	Waller-Duncan k-ratio test.

Choosing among these is not easy, because there advantages and disadvantages to each of them. For example, Scheffe's multiple-comparison procedure is one of the most conservative tests. If you choose Scheffe's test, your chances of making a Type I error are small, while your chances of making a Type II error are not small. A Type I error shows that significant difference exists when there is no true significant difference between the means. A Type II shows that there is no significant difference when there is a true difference between the means. Since choosing a post hoc test often involves this trade-off between Type I and Type II errors, there is a controversy concerning which post hoc comparison is best: different disciplines prefer different tests. Therefore, you should examine the research in your own discipline to determine which post hoc comparisons are preferred.

One limitation of the MEANS statement is that post hoc comparisons can be performed only on main-effect means. Interaction terms are not allowed.

If you have unbalanced data or have performed an analysis of covariance, then the MEANS statement is not recommended. Instead, you should use the LSMEANS statement in PROC GLM. The LSMEANS are the least-squares estimates of the means. For unbalanced data, they are the means that would have occurred had there been an equal number of observations in each group. For analysis of covariance, least-square means are the adjusted means, the means that would have occurred had there been no differences between the groups on the covariate.

The syntax of the LSMEANS statement is: **LSMEANS** ***effects / options*****;**

Using the LSMEANS statement with no options produces the least-squares means. The only post hoc comparison available with LSMEANS is the pairwise t-test. If you want pairwise t tests on the least-square means, simply specify the PDIFF option, which works for both main effects and interaction effects.

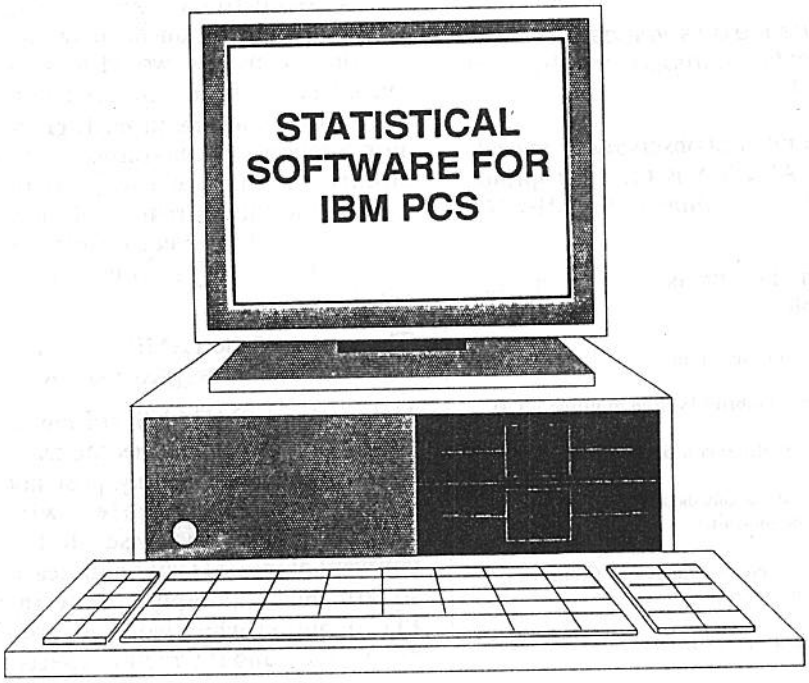
The only problem with the obtained probabilities is that there is no protection against the Type I experiment wise error rate. The experiment wise error rate takes into account the fact that numerous comparisons of means are being made. Therefore, it is recommended that the Bonferroni adjustment be used. To make the Bonferroni adjustment, divide the alpha level by the number of comparisons made and use the obtained results as your significance level. For example, if your original alpha level is .05 and you make six comparisons, then the Bonferroni adjustment will make your new significance level: $.05 \div 6 = .008$

This month's Benchmarks Forum questions and answers are from the University of Texas Computation Center Newsletter, March 6 and April 3, 1989 issues.§

***Benchmarks* Reader/User feedback is encouraged.**
Send all letters, suggestions,etc to (AS04@UNTVM1), FAX 817-565-4060 or to the *Benchmarks* Editor at:

Academic Computing Services
University of North Texas Computing Center
NT Station, Box 13495
Denton,Texas76203

MICROCOMPUTERS



The University of North Texas currently has site licenses for three statistical packages that run on IBM microcomputers: SPSS/PC+, SAS/PC, and MICRO CRUNCH. Each license has its own rules and regulations governing the distribution of the software. These regulations are a source of much confusion among computer users at UNT. It is hoped that this article will clarify matters.

SPSS/PC+: Currently, we have version 3.0 of SPSS/PC+ available. It includes the BASE, ADVANCED STATISTICS, TRENDS, TABLES, and GRAPHICS modules. In order to have SPSS/PC+ installed, the following conditions must be satisfied.

1. You must be classified as full-time faculty or staff at UNT. This includes instructors, **but not** Teaching Fellows, Teaching Assistants, and/or Reseach Assistants.

2. The PC on which SPSS/PC+ is to be installed must belong either to UNT or to the faculty or staff member who requested the software.

3. If SPSS/PC+ is to be installed on your personal PC to be used at home, it must be removed when you resign from UNT. To install SPSS/PC+ on your home machine, you will need to bring your PC to the Computing Center.

4. If SPSS/PC+ is to be installed on a Novell Network file server, all workstations on the network must be registered.

SAS/PC: The current version of SAS/PC is 6.03, and we have the BASE and STAT modules available. At the present time we are in the process of acquiring the IML, ETS, OR, FSP, and GRAPH modules. These should be available by the beginning of the Fall Semester. Criteria to have SAS/PC installed are the same as for SPSS/PC +above.

Both SAS/PC and SPSS/PC+ are fairly similar to their counterparts on the NAS mainframe. In fact, SAS data and programs for the mainframe will run on the PC version with no or minor modification. SPSS^X, on the other hand, has a procedure to convert program code and data from PC to mainframe and vice versa (see page 9 of this newsletter for further information on this procedure). The PC version, however, provides the advantage of interactive sessions which make it more convenient to use.

In order to have either SAS/PC or SPSS/PC+ installed, contact the Computing Center at (817) 565-2324. **Before they can be installed on your PC, you need to have a minimum of 13 megabytes of hard disk space available.**

SAS/PC -vs- SPSS/PC+

It is possible to request that both SAS/PC and SPSS/PC+ be installed.

However, installing both is impractical if you have a hard disk smaller than 30 megabytes in size. Hence, it is a matter of personal choice to select one over another. This section outlines some advantages and disadvantages of the two programs in order to help you make a selection.

A Look at SAS/PC

Advantages

1. SAS/PC and SAS mainframe are very similar in their command syntax. Hence, programs and data are interchangable. In fact, with the Micro to Host Link module, you can run SAS on CMS while working on SAS/PC. You can even use data stored on both systems. Data can be uploaded and downloaded with SAS PROC.

2. SAS provides extensive programming capability in its data step. This make data manipulation very flexible.

3. With the IML module, you will have the capability to do matrix operations and computations. This will make it easier to customize statistical procedures appropriate to your research.

Disadvantages

1. SAS is slow when running on 8086 class machines (this includes the NTPC).

2. SAS is licensed annually. You will need to get an upgrade from the Computing Center every year.

3. SAS is more difficult to learn for a new user.

A Look at SPSS/PC+

Advantages

1. The menu system makes it easy for a new user to use.

2. With the combination of Microsoft Chart, Chart Master, or GrafTalk software, Graphics can be easily generated with SPSS/PC+. You need to acquire the chart software mentioned above on your own, however.

3. Data are interchangable with mainframe SPSS^X. Programs, however, will require a simple conversion process (see page 9 of this newsletter for a description of this process).

4. Does not require an annual update.

Disadvantages

1. Data manipulation is limited. This may cause some inconvenience if you need to do a complex data transformation.

2. Does not have matrix operation and manipulation capability.

MICRO CRUNCH

MICRO CRUNCH is a lesser known statistical package in comparison to SAS/PC and SPSS/PC+. It provides most of the statistical procedures which are available in SAS/PC and SPSS/PC+. However, it does not require much hard disk space. The software is contained on two 360K floppy disks. It is easy to learn and use, and is available to all faculty, staff, and students if they plan to use it for a class-related project. To obtain MICRO CRUNCH, you need to bring two formatted 5 1/4" 360K floppy diskettes or one 3 1/2" 720K diskette to the Computing Center (ISB 119).

This Review was provided by Panu Sittiwong, Academic Computing Consultant (BITNET:AC09@UNTVM1). *It has been reprinted, with minor revisions, from the December, 1988 issue of* ***Benchmarks.*** §

Converting Foreign Files to SAS/PC and SPSS/PC+ Data Sets

By Phanit Laosirirat, Academic Computing Services Statistical Consultant (BITNET: AC44@UNTMUSIC)

Any foreign file that you plan to convert to either SAS/PC or SPSS/PC+ data sets should be in a tabular form. That is, all items in a given column should represent the same type of data (character or floating point). After conversion, each row of the foreign file becomes an observation in the SAS/PC or SPSS/PC+ data set.

Foreign Files That Can Be Converted

SPSS/PC+ can convert an original foreign file directly into an SPSS/PC+ data set. A foreign file can be in any of the following forms:

FOREIGN FILE	FILE KEYWORD
1-2-3 Release 2.0	WK1
1-2-3 Release 1A	WKS
Symphony	WRK
Multiplan (symbolic format only)	SLK
All dBASE	DBF
dBASE-II	DB2
dBASE-III, Dbase-III Plus	DB3

SAS/PC can convert the following foreign files:

1-2-3 Release 2.0	(Data Interchange Format (DIF) only)
1-2-3 Release 1A	(Data Interchange Format (DIF) only)
VisiCalc	(Data Interchange

Format (DIF) only)

Any spreadsheet file that is in DIF format

Dbase-II version 2.4

Dbase-III version 1.0

Dbase-III version 1.1.

SPSS /PC+ Statements for File Conversion

SPSS/PC+ uses the **TRANSLATE** command to convert a foreign file to an SPSS/PC+ data set. You can also use the **TRANSLATE** command to convert an SPSS/PC+ data set back to a foreign file. For example:

```
TRANSLATE FROM='PROJECT.WK1'
    /TYPE=WK1
    /RANGE=A1..J100.
```

In the above example, the **TRANSLATE** command creates an active file from the 1-2-3 file PROJECT.WK1. The **TYPE** subcommand indicates the format of a foreign file. **TYPE** is optional if the file extension named on the **FROM** subcommand corresponds to the format keyword. The **RANGE** subcommand translates a specified set of cells from the spreadsheet file.

In the example below, the **TRANSLATE** command creates a 1-2-3 file from an SPSS/PC+ active file.

```
TRANSLATE TO='PROJECT.WK1'
    /TYPE=WK1.
```

SPSS/PC+ also has several subcommands available that allow you to tailor your converted file to the way you want it.

Caution for Lotus Users: By default SPSS/PC+ uses the column letters as variable names. SPSS/PC+ also takes the first row format as its variable format after conversion. Many Lotus users, however, normally put the field labels on the first row of the spreadsheet. These labels or names can be transferred as SPSS PC+ variables by using the **FIELDNAMES** subcommand. This is where problems often occur. After the field label row, it is customary to put a blank row before the first row of data. When SPSS/PC+ starts reading the data, it begins from the line immediately below the field label row. Since it is blank, SPSS/PC+ assigns system-missing values to every column of the first row. By default, SPSS/PC+ reads these as character missing values. As mentioned above, the format of the first row will be the format of the variables for the entire rows. After conversion, therefore, you will end up with all the numeric variables missing.

SAS/PC Statements for File Conversion

SAS/PC uses two different procedures for file conversion:

- **PROC DIF** for converting Data Interchange Format (DIF)
- **PROC DBF** for converting Dbase II and Dbase III files.

Thus, foreign files that SAS/PC is able to convert can be grouped into two types: **DBASE** and **DIF** files.

PROC DIF is used when you want to convert a DIFformatted file into a SAS/PC data set. However, DIF is not the default format in most programs. For example, the default format of a LOTUS 1-2-3 file is not DIF. If you want to convert a 1-2-3 file into a SAS/PC data set, you have to use the LOTUS translate facility to translate WK1 format files into DIF format before you do any file conversion (consult your LOTUS manual before you do this).

In the following example, a DIF file named **EMPLOYEE.DIF** is converted to a SAS/PC data set. **FILENAME** and **LIBNAME** statements are used to specify file references and library references. **FILENAME** tells SAS/PC where to get the DIF file and to use **DATAIN** as a reference to **C:\EMPLOYEE.DIF**. **LIBNAME** tells SAS/PC to use the directory **C:\SASDATA** to save the output SAS/PC data set and to use **DATAOUT** as the directory reference. Your output SAS data set will be saved in the directory **C:\SASDATA** under the name **EMPLOYEE.SSD**.

```
FILENAME DATAIN
'C:\EMPLOYEE.DIF';
LIBNAME DATAOUT 'C:\SASDATA';
PROC DIF DIF=DATAIN
OUT=DATAOUT.EMPLOYEE;
RUN;
```

The next example converts a dBASE II file named **EMPLOYEE.DBF** to SAS/PC data set.

```
FILENAME DATAIN
'C:\EMPLOYEE.DBF';
LIBNAME DATAOUT 'C:\SASDATA';
PROC DBF DB2=DATAIN
OUT=DATAOUT.EMPLOYEE;
RUN;
```

In the example below, a dBASE III file named **EMPLOYEE.DBF** is converted to SAS/PC data set.

```
FILENAME DATAIN
'C:\EMPLOYEE.DBF';
LIBNAME DATAOUT 'C:\SASDATA';
PROC DBF DB3=DATAIN
OUT=DATAOUT.EMPLOYEE;
RUN;
```

One can also convert a SAS/PC data set into a DIF or a dBASE file. For example:

```
FILENAME DATAOUT
'C:\LOTUS\EMPLOYEE.DIF';
LIBNAME DATAIN 'C:\SASDATA';
PROC DBF DB2=DATAOUT
DATA=DATAIN.EMPLOYEE;
RUN;
```

In the above example, a SAS/PC data set, **DATAIN.EMPLOYEE**, is converted to a DIF file called **EMPLOYEE.DIF**, and saved on the C drive and under a directory named LOTUS.

Individual help with converting files from other applications into SPSS/PC+ and SAS/PC data sets can be obtained by calling or coming by the Help Desk, ISB 119 (545-4050). The Help Desk hours are the same as those of the Information Science Library and are published on the inside front cover of every issue of *Benchmarks*. §

WordPerfect 5.0 Maintenance Release Arrives

By Sandy Franklin, Academic Ccomputing Services Microcomputer Support Staff

WordPerfect Corporation has just released the latest maintenance version of WordPerfect 5.0 dated April 29, 1989. We will try to upgrade those of you on the site license as soon as possible. Please call to schedule an appointment with Microcomputer Support (565-2324) and we will install the latest maintenance release. Please keep in mind that we have installed over 300 copies of WordPerfect on campus since December.

Those of you not on the site license but with individually licensed copies of WordPerfect 5.0 can also call to schedule the update installation. We will only install the maintenance release on the original WordPerfect diskettes to maintain the integrity of the copyright laws.

Following is a list of changes since the January 3, 1989 release.

WordPerfect 1 & 2 Diskettes (4/29/89)

The following files have changed since the 1/3/89 interim release: NWPSETUP.EXE (For network version only), WP.EXE, WPHELP.FIL, WPHELP2.FIL, WP.FIL

The following are enhancements* and changes to the 4/29/89 version of WordPerfect:

- **Conversion** - When converting 4.x files to 5.0, WordPerfect checks the initial font. If the font is other than 10pitch, WP inserts a tab set code [TAB SET] with the correct tab stops for that specific pitch.
- **Conversion** - New .CRS commands for conversions from 5.0 to 4.2 are: FT, AO, AF, BP, WC, and MB.
  The procedure and the concept for the conversion resource file is the same as it is in converting 4.2 documents to 5.0 (see WordPerfect Documents in the Appendix of the WordPerfect Reference Manual). The MB command is used in both conversions.
- **Font Command** - FT commands represent WordPerfect 5.0 Base Font codes. Place the Base Font code you want to convert directly after the FT. Place the WordPerfect 4.2 font and pitch after the equal sign. For example, if you want to convert a 5.0 Times Roman 10pt. Base Font to a 4.2 Font 2, Pitch 13, the command should read as follows:

  FT [Font:Tms Rmn 10pt] = 2,13[HRt]

- **Attribute On/Off Command** - AO and AF represent WordPerfect 5.0 Attribute On/Off codes (e.g., Italics, Small Caps, etc.). Attribute codes are converted to a 4.2 Font/Pitch code. To edit Attribute On/Off commands, move the cursor to the immediate right of the AO command. Press Block (Alt-F4) to turn on Block, move the cursor to the immediate right of the AF command, then use the Font key to select the attribute you want to convert. Place the 4.2 font and pitch numbers after the equal sign. An example of an edited Attribute On/Off command is shown below.

  AO [ITALC] = 3,10[HRt]
  AF [italc] = 1,10[HRt]

- **Bin Paper Command** - WordPerfect 5.0 Paper Size/Type codes that are used to select paper from a particular bin location are represented by BP. Place the Paper Size/Type code directly after the BP. Edit the WordPerfect 4.2 bin number after the equal sign. An example of a Bin Paper command follows:

  BP [Paper Sz/Typ: 9.5"x4", Envelope] = 2[HRt]

- **WordPerfect Character Command** - The WordPerfect Character command converts WordPerfect Characters to 4.2 extended characters. Insert a character from the WordPerfect Character set directly after the WC. Place the WordPerfect 4.2 font and character number after the equal sign. An example of a WordPerfect Character command is shown below:

  WC [:4,23] = 1, 9[HRt]

- **Date** - The month and day names are translated into the current language (see Language on the next page).
- **Excel Charts** - Excel charts can be placed in WordPerfect graphics boxes. From Excel, you should output the chart to a plotter. To do so, first enter the Port section of the WIN.INI file and define an output file (e.g., OUTPUT.PRN=). Enter **CONTROL.EXE** and install the HP Plotters. Then enter Excel, select the HP 7475A as the plotting device, and connect the plotter to the output file you previously defined in WIN.INI. Select only one pen for the plotter--

*A list of all enhancements made to WordPerfect 5.0 since its initial release is available on a separate diskette. You can order the "Enhancements Document" diskette ($10.00 charge) by calling Soft-Copy Order Processing at 1-800-222-9409.

this forces the chart to print in patterns. Print the chart; an HPGL plotter file OUTPUT.PRN is created which can then be imported into WordPerfect. If you plan to output more than one chart, you must change the output filename for each chart, otherwise the charts will overwrite each other.

- **Footnote** - The (Continued...) message is translated into the current language (see Language further in this list).
- **Graphics** - Option (5) on the Figure Edit screen forces an image to print and display in black & white. You can use this option if you want the filled areas of a VECTOR image (e.g., *.WPG file) to print in solid black, rather than in patterns. This option does not affect the printing of BITMAPPED images (e.g., *.PCX). However, the image will display on the screen in black and white patterns, rather than in colors.
- **Graphics** - WordPerfect will allow right, left, or center aligned horizontal graphics lines to extend into the margins. For example, if the line is right aligned, WordPerfect will allow you to specify a line length that will extend the line into the left margin.
- **Graphics** - The limit for page and paragraph type boxes around which text will wrap is 100 per page. Note, however, that 100 may not be possible in all cases--your computer must have sufficient memory.
- **Graphics** - EPS (Encapsulated PostScript) files can be printed on a PostScript printer. In addition, EPS and bitmapped images can be rotated, scaled, and mirrored if they will be printed on a PostScript printer. **NOTE:** You must update the PostScript printer diskettes. To order a new PostScript printer diskette ($10.00 charge), call SoftCopy Order Processing at 1-800-222-9409.
- **Graphics** - Graphics can be printed in landscape orientation HP LaserJet printers. **NOTE:** Your printer file must be modified before graphics will print in landscape. You can modify it with the Printer Definition Program, or you can order a new printer diskette ($10.00 charge) by calling SoftCopy Order Processing at 1-800-222-9409. Modifying your printer file is easy: At DOS, change to the directory where PTR.EXE is located. Execute PTR by typing "PTR filename", where "filename" is the name of your .PRS file (e.g., HPLASEII.PRS). Press Enter to edit the printer definition and select Miscellaneous Information. Then type an asterisk (*) next to Rotate Graphics in Landscape. Press Exit twice, save the file, confirm that you want to replace the old version of the file, and exit PTR.
- **Hyphenation** - If you don't have the WordPerfect Hyphenation Modules, you can instruct WordPerfect to use its internal rules to hyphenate without prompting you. To do this, the language of the document should be US, EN, or UK. Set a path for the Hyphenation Modules in the Location of Auxiliary Files (Even though the Hyphenation Modules are not present, this step is necessary.) When you turn on Auto Hyphenation, WordPerfect will use its internal rules to hyphenate.
- **Language** - The WP.LRS (Language ReSource) file has been placed on the Conversion Diskette. You should copy the file to the directory where WP.EXE is located. WP.LRS contains text in nineteen languages (e.g., days of the week, months) and is used by WordPerfect to display the correct text when you use the Date feature or the Footnote (Continued...) message. If the current language is not in the .LRS file, the language of your WordPerfect package is used. The WP.LRS file is a secondary merge file that can be edited. To do so, either retrieve the file into Notebook (a program that is part of the WordPerfect Library and Office packages), or retrieve the file into WordPerfect. Make the desired changes and save the file.
- **LaserMaster** - The LaserMaster LM2/LX6 board is supported. NOTE: You must update the latest printer driver. To order the "Printer 19" Diskette, call SoftCopy Processing at 1-800-222-9409.
- **Macros** - When you choose to replace a macro, WordPerfect prompts you to confirm the replacement.
- **Math** - When Math is on and Typeover mode is active, pressing Tab moves the cursor and does NOT insert a tab.
- **Math** - A Math On code can no longer be placed in Initial Codes.
- **Math** - Math will calculate numbers that are inserted with right justified tabs.
- **Printing** - When printing to a parallel port (e.g., LPT1) on a non-network printer in single-user WP or network WP, WordPerfect does a DOS Open and Close on the port at the start and end of the print job. This allows network spoolers to properly sense the end of a print job.
- **Printing** - The rush job feature displays the last print job as the default job number.
- **Printing** - Both printing and downloading of soft fonts are significantly faster.
- **Printing** - WordPerfect does NOT reset the state of the printer before sending an em-

bedded printer COMMAND. WordPerfect does reset the printer state before an embedded printer FILE.

- **Printing** - The menu selection for baud rate displays 19200 for the first selection instead of 110. If you select 19200 and your machine does not support that baud rate, 110 will be used instead.
- **Rdln/Strkt** - The Remove Redline Markings and Strikeout Text from Document feature works in headers and footers.
- **Screen** - Up to 250 display columns are allowed.
- **Setup** - A new setup option in Initial Settings allows you to retrieve a document and reformat it for the currently selected printer, regardless of the printer selection that was saved with the document.
- **Speller-** In a word count, the speller does not count words consisting of all digits.
- **Speller** - When using a supplementary dictionary file that is password protected, there is a menu which asks whether you want to reenter the password or continue without the supplementary dictionary.
- **Startup** - The /nb switch instructs WordPerfect to overwrite the original document when you save a file. Usually, WordPerfect renames the old file to filename.bk! and deletes the .bk! file when the file is saved.
- **Styles** - In the past, if a user did not give a name to a style it was left blank. Now, a name will be given to the style starting with "1," then "2," etc.
- **Styles** - When you attempt to edit a graphic contained in a style, WordPerfect displays a message indicating that you must edit the style to edit the box.
- **Type Through** - The WordPerfect Type Through feature has been removed from WP and is now a stand-alone utility. To order the utility, free of charge, call SoftCopy Order Processing at 1-801-225-5000.
- **View Doc** - Home, home, down arrow takes you to the bottom of the viewed document.

Network WordPerfect

- **Form Number** - The initial form number can be set to zero.
- **3Com 3+**- The 3Com option on the network selection menu has been changed from "3Com 3+" to "3Com 3+/3+ Open".
- **Printing** - When printing to a parallel port on a non-network printer in single-user WP or network WP, WordPerfect does a DOS Open and Close on the port at the start and end of the print job. This allows network spoolers to properly sense the end of a print job.

Fonts/Graphics Diskette (4/29/89)

The following file has changed since the 1/3/89 interim release: GRAB.COM

This enhancement has been made to the 4/29/89 version of GRAB.COM:

- **/C Startup** - Entering GRAB /C0 will prevent the computer from hanging when Grab is loaded after Sidekick. The /C option specifies the number of times Grab should try to recapture the interrupt. /C enables a single recapture attempt, /Cn enables n recapture attempts, where n = 0-5. Note: Loading GRAB /C0 before other TSRs also allows the non-numeric arrow keys on the enhanced keyboard to scale the grab box when shifted.

Graphics Drivers

This diskette contains graphics drivers for the following monitors: IBM 8514A, Genius 2, Genius 1, Wyse 700, ATI VIP VGA, Genoa Super VGA HiRes, Orchid Designer VGA, Extended EGA Mode 12, NEC GB-1 High Resolution Mode, Paradise Autoswitch EGA 480, VEGA VGA (Video Seven), Verticom Full-Screen, Viking Moniterm.

Drivers written by third parties (not supported by WordPerfect Corporation) include: Everex EGA, Everex VGA (Deluxe), Everex VGA (Deluxe II), Everex Evergraphic Deluxe, ETAP ATRIX.

Switches

Certain BIOS inconsistencies on some popular video boards can be overcome by starting WordPerfect with the correct switch:

- **/f2** - This switch allows WordPerfect to run in extended text modes when using the Paradise Autoswitch EGA 480 and the Paradise VGA Plus cards. This may help with other cards that exhibit the same problem.

To use WordPerfect in extended text modes do the following:

1. Set the text mode desired before entering WordPerfect. Each Paradise card comes with software which will allow the user to select extended text modes (VGAPLUS.EXE, 13243.COM, etc.).

2. Run WordPerfect. WordPerfect should automatically recognize the current number of columns and rows. It will preserve this configuration when exiting graphics screens or exiting to DOS.

Convert Diskette (4/29/89)

The following files have changed since the 1/3/89 interim release: CONVERT.EXE, GRAPHCNV.EXE, MACROCNV.EXE, MACROS.WPK, STANDARD.CRS, WP.LRS

The following are changes and enhancements to the programs and files on the 4/29/89 Convert Diskette:

- **FC.EXE** - The Font Conversion program has been removed from this diskette. You can order a free copy of the program by calling WordPerfect Information Services at (801) 225-5000.
- **GRAPHCNV** - has 2 new switches: /C-B, /C-W. /C-B changes all colors in a .WPG file to black (i.e., black ink on white paper). /C-W changes all colors in a .WPG file to white. Note that these are different mappings than /C-2.
- **STANDARD.CRS** - New commands for conversion from 5.0 to 4.2 are: FT, AO, AF, BP, WC, and MB. See the Conversion heading in README.WP for more information.
- **WP.LRS** - The new Language Resource file contains information WordPerfect needs to display certain strings (e.g., date) in the current language. You should copy this file to the directory where WP.EXE is located. See "Language" in README.WP for more information.

PTR Program Diskette (4/29/89)

The following file has changed since the 1/3/89 interim release: PTR.EXE

The following are enhancements and changes to the 4/29/89 version of PTR:

- **Code Page** - Code Pages are now supported. The /cp startup option tells WordPerfect which code page your hardware (BIOS) uses. Setting this option lets you access the proper keyboard and 256-character character set for which your system is preset. WordPerfect supports the following code pages:

  437 English
  850 PC Multilingual
  851 Greek
  8510 Greek Alternate
  860 Portuguese
  8600 Portuguese (Brazil)
  861 Icelandic
  863 French (Canada)
  865 Norwegian and Danish

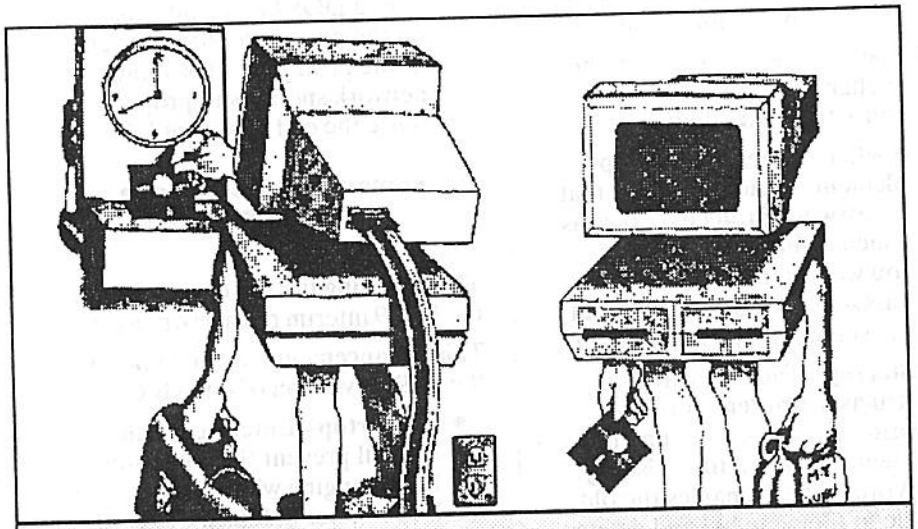
  You do not have to use this option if your version of WordPerfect is preset to your code page. You also do not have to use this option if you have DOS 3.3 or higher and have placed a COUNTRY command in your CONFIG.SYS file. If you use this option to enter a code page for which your system is not preset, you may be able to print characters for the code page you entered, but you cannot change the way characters are displayed on the screen. A character is displayed according to the system code page.
- **Help** - Help works with screen widths greater than 128 columns.
- **WP Strings** - WordPerfect strings are allowed in the PTR prompt command.

Speller Diskette (4/29/89)

The following files have changed since the 1/3/89 interim release: SPELL.EXE, WP{WP}US.LEX

Thesaurus Diskette (4/29/89)

The following file has changed since the 1/3/89 interim release: WP{WP}US.THS §



MICRO-TIPS

This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the Benchmarks editor for possible inclusion in a future issue.

Protecting Your Rights When Buying Through Mail Order

One way to get popular microcomputer software at disciount prices is to order it from discount catalogues. Mail order sales are governed by rules of the Federal Trade Commission (FTC) and various state laws.

According to FTC rules:

- The seller must ship your order within 30 days of receiving it, unless the ad clearly states that it will take longer.
- If it appears that your order will not be shipped when promised,

the seller must notify you in writing in advance of the promised date, giving a definite new date, if known, and offering you the opportunity to; cancel the order with a refund, consent to a definite delayed shipping date, consent to an indefinite delayed shipping date.

- The seller's notice must contain a stamped self-addressed card or envelope with which you can indicate your preference. If you don't respond to this notice, the seller may assume you agree to the delay, but must either ship or cancel your order within 30 days after the original shipping date promised or required. A prompt refund must be made when an order is cancelled.
- If you have consented to an indefinite delay, you still have the right to cancel the order at any time before the item has been shipped.
- If you choose to cancel an order that has been paid for with a check or money order, the seller must mail you a refund within seven business days. If you cancel an order for which you paid by credit card, the seller must credit your account within one billing cycle following receipt of your request. Store credits or vouchers in place of a refund are not acceptable.
- In the event that the item you ordered is unavailable, the seller may not send you substitute merchandise without your explicit consent.

Tips When Ordering By Mail

- State precisely what merchandise you want, specifying details such as model, make, size, component parts, etc.
- Confirm the price and expected delivery date as stated in the ad.
- Indicate whether you will accept a substitute product if the item you ordered is unavailable, and, if not, that your payment should be returned.
- Do not send cash because you will have no record of payment if problems should arise.
- Keep a copy of your order and all other correspondence with the seller in one place. Your records should include the following:
  - The company's name, address, and phone number.
  - A description of the item ordered.
  - Your cancelled check or a copy of the money order.
  - Record of the date you mailed the order.
  - The time and date of your conversation.
  - The name of the person you talked with
  - Any sales slips and shipping receipts.
- Ask about servicing and refund/return policies and with whom you should correspond if there is a problem.

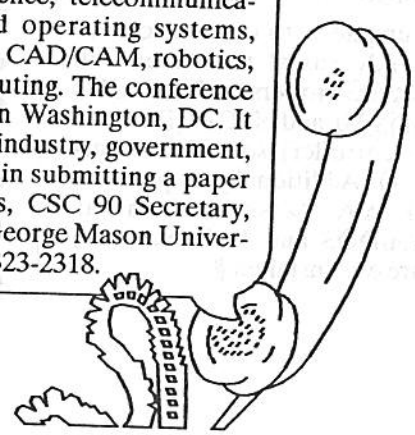
If You Have Problems

- If you have not received your order as promised or if the item is defective, immediately notify the seller in writing referring to your order by description, price, date, as well as by account number and order number, if available. Make sure you keep a copy of the letter.
- If you complain by telephone, send a follow-up letter to confirm what was said.
- If you think the merchandise is defective, reread your product instructions and your warranty carefully to be sure you do not expect features or performance the product is not designed to give. Contact the seller for instructions. Do not return it to the Seller until you have been instructed to do so.
- When returning merchandise make sure you keep the shipper's receipt or packing slip; your right to be reimbursed for postal cost is determined by store policy.
- If you have completely discussed your problem with the Seller and are still not satisfied, write to the consumer complaint agency in the seller's state. If you paid for the merchandise by credit card, you may have rights to withhold payment under the Fair Credit Billing Act.

This month's MICRO-TIP was furnished by Janis Burkham, Academic Computing Services Database Consultant.§

CALL FOR PAPERS

According to the May issue of *Information Center* Magazine, the Association for Computer Machinery (ACM) is asking for papers to be presented at the 1990 Computer Science Conference on hybrid computers, neural networks, artificial intelligence, telecommunications and computers, distributed operating systems, hardware and software engineering, CAD/CAM, robotics, and visualization in scientific computing. The conference will be held February 20-22, 1990 in Washington, DC. It will focus on cooperation between industry, government, and universities. Anyone interested in submitting a paper should contact Barbara Kyriakakis, CSC 90 Secretary, Department of Computer Science, George Mason University, Fairfax, Virginia 22030, (7 03) 323-2318.



VAX COMPUTER CLUSTER

VAX Upgrades

By Billy Barron, VAX System Manager
(BITNET: BILLY@UNTVAX)

During the week of May 15th, several software packages were upgraded on the VAXcluster. The first and foremost, the VMS operating system was upgraded to version 5.1.

VMS 5.1 is primarily a "bug fixed" version of VMS 5.0. Most of the fixes will be transparent to the user. However, one bug that was noticed by a few users was the fact that under VMS 5.0, MAIL folder names did not support lower case characters in quotes. This capability has been restored with VMS 5.1.

VMS 5.1 also includes the DECwindows package, which is an X-Window (i.e., Macintosh-like) interface for VAX/VMS. Academic Computing Services did not install this package since the University only has 2 or 3 graphics workstations or terminals that are supported. If and when more VMS graphics workstations are acquired around campus, we will re-evaluate our decision about the installation of DECwindows.

Other upgrades to the VAXcluster were VAX Pascal to version 3.9, VAX Fortran to version 5.2, VAX C to version 3.0, and HSC50 (Disk and Tape Controller) software to version 3.90. Additionally, a patch to the PCSA (also known as DECnet/DOS and VMS Services) software was installed.§

ANUNEWS: A Network Mailing List Utility

By Larry G. Michalewicz, Vax Operator/Programmer (BITNET: LARRY@UNTVAX)

ANUNEWS is a new utility running on the VAX. The main purpose of this utility is to give users an easy way to read and send messages to and from network mailing lists like info-apple or info-ibmpc. To invoke ANUNEWS, simply type ANU you will then see a menu that looks something like this.

```
NEWSGROUPS [ALL, 3 Newsgroups]

   Newsgroup        Count          Unread

->1 anunews          3               1
  2 big-lan          4
  3 info-apple       9

NEWS>
```

To view a message in a specific news group, simply type the number of the news group or use the arrow keys to move the arrow to the news group that you wish toselect. After selecting a news group, you will see a menu of news items within the selected newsgroup. To read a message, simply type its number or use the arrow keys.

Commands You Should Know

Some of the commands you should know are listed below

- **HELP** - Help works just like VMS help.
- **DIR/ALL** - Lists all newsgroups.
- **DIR/NEW** - Gives you a list of all newsgroups that have new messages.
- **DIR/REG** - Lists newsgroups to which you are registered. NOTE: to deregister from a specific newsgroup like INFO-APPLE type **DEREG INFO-APPLE**
- **POST** - The post command posts a message to the local newsgroup and also sends a copy to the network mailinglist. **NOTE:** users who use the EDT editor, you must add the following line to you login.com file:

DEFINE NEWS_EDIT CALLABLE_EDT

- **FOLLOWUP** - Followup is almost the same as post except that it includes a copy of the current message in the message you are sending.
- **REPLY** - Reply sends a message to the original sender and does not post the message to the local newsgroup. Reply sometimes does not work because the address of the original send sometimes gets lost.
- **SKIP** - Skip marks the message as having been read. This command is useful when you read the subject of a message and your sure it doesn't interest you.

Some commands are mapped to the numeric keypad. To find out what commands are on which keys type: **HELP KEYPAD**

PROCOMM Note

If you use PROCOMM, make sure you change your line wrap to off. The line wrap parameter is in the Terminal Setup (<ALT><S><2>) screen.

A FINAL WORD

For some users, some of this may not make very much sense, don't let that stop you from giving ANUNEWS a try. It's really an easy program to use. If you have any questions or suggestions, simply post a message to the newsgroup named

ANUNEWS_LOCAL_QUESTIONS_AND_ANSWERS

or, send MAIL to OPERATOR. If you are already subscribed to some of the mailing lists like INFO_MAC, you may want to unsubscribe since all messages come to ANUNEWS anyway. If you would like to see a group that we don't have, let us know and we will see what we can do. §

VAX CLUSTER USAGE STATISTICS

April Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. LOGINOUT	User login	112833	18.0
2. SET	VMS Utility	92930	14.8
3. DELETE	VMS Utility	59690	9.5
4. EDT	Editor	41012	6.5
5. DIRECTORY	VMS Utility	39171	6.3
6. TYPE	VMS Utility	32832	5.2
7. NETSERVER	DECnet Server	32083	5.1
8. User programs	Compiled Programs	25509	4.1
9. PASCAL	Pascal Compiler	21876	3.5
10. SHOW	VMS Utility	21484	3.4
Total		63657	

April Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	24 10:34:26.69	61.7
2. EDT	Editor	2 01:38:10.01	5.2
3. PASCAL	PASCAL Compiler	1 20:51:59.20	4.7
4. LISP	Lisp Interpreter	1 07:49:13.53	3.3
5. MAIL	VMS Mail	0 21:10:07.01	2.2
6. DISKEEPER	Disk Defragmenter	0 18:38:50.90	2.0
7. LOGINOUT	User login	0 17:44:11.40	1.9
8. SORT	VMS Utility	0 15:02.24.44	1.6
9. BACKUP	VMS Utility	0 13:12:41.23	1.4
10. TPU	TPU Editor	0 09:20:38.31	1.0
Total		38 21:50:54.61	

BEST OF THE BBS

Edited by Billy Barron,
VAX System Manager
(BITNET: BILLY@UNTVAX)

May 1989

Welcome to the new *Best of the BBS* column. This column highlights some of the more interesting and useful discussions on the UNT BBS. From those of you not familiar with the BBS, here is how to log into the UNT BBS.

- Sign-on by typing **CALL DEC** at the LAN prompt and then entering BBS as your Username at the VAX prompt.

- If you are already logged-on to the VAXcluster, type **BBS** at the $ prompt.

The opinions expressed in this column do not necessarily reflect the views of Academic Computing Services or the Computing Center. Also, information in ***Best of the BBS*** has not been checked for accuracy.

Apple Kermit

#8348 Reply to #8338

Subject : RE: UP/DOWN LOADING --- and apple kermit

Believe me folks, whatever comm program you are using to upload and download on, it has got to be better than Apple Kermit. Kermit works, barely on an un-enhanced IIe, but the primary thing that you need to know about it is setting the file download type to the correct one depending on the format of the file that you want to receive. There is a whole, and slightly technical, explanation of all of this in the documentation that you receive with the program, so make sure to read it.

.....

#8393 Reply to #8348

Subject : RE: UP/DOWN LOADING --- and apple kermit

I don't use Apple Kermit for terminal emulation (never ever). I only use it for uploading and downloading, which is does better than any other program.

Name one other program that you can upload to the VAX with using any type of error checking protocol that works correctly on an unenhanced IIe.

MS-DOS Problems

#8555

Subject : dos problems

I am having a problem loading pcdos ver 3.3 to a 8088 pcxt clone. I purchased a 3 1/2" floppy 720k and I am unable to config the current DOS ver 3.1 to use the new drive. I have tried to boot the pc up from the 3 1/2 with the DOS 3.3 and it gives an error. Is there anyone who might know what my problem is.

Thanks for your help,

.....

#8573 Reply to #8555

Subject : RE: dos problems

First thing to check is whether or not the disk is a dos SYSTEM disk. Of course if it is not.. then it wont boot.

Second piece of advice is to check and see if you need to install a device driver via the config.sys route. I know that there are certain configurations of XT clones and floppy drive cards that DO need a device driver when dealing with the 3 1/2 drives.

Older Bioses are unable to handle the new drives. I believe it is sometime in mid 87 or 88 that Bioses were upgraded to handle this new format. If you have purchased the PC in the past year, you are probably OK. If on the other hand, you have purchased a 1983 Compaq deskpro or similar machine, Buddy you're up a creek!

Hope you resolve the problem..

Music Program Available on BBS

#8623

Subject : Music program

All of you with IBM pc clones; there is a new program in the SOUND area called VM0389. This is the latest version of VMUSIC which really plays fairly decent multi-voice music on the PC internal one-bit speaker. For the techies, the technique is explained in the readme files and is pretty interesting. It's essentially a one bit D to A converter. Some very nice scoring of musical selections is included. Also instructions sufficient to allow you to code up your favorite tunes. I just uploaded this last night, but the older version with much less music is VM1088. Check it out.

3.5" Disk Driver Problem

#9735

Subject : DEVICE DRIVER

I HAVE AN OLD IBM PC(1986) AND A 3.5" DRIVE WHICH IS A 720 BUT RIGHT NOW, WITHOUT THE DEVICE DRIVER, IT ONLY GIVES ME 360 MEMORY INSTEAD OF 720 MEMORY. THEREFORE IF THERE'S ANY WAY YOU CAN HELP ME IN OBTAINING THE DEVICE DRIVER NEEDED, PLEASE DO INFORM ME AS SOON AS POSSIBLE. THANK YOU.

.....

#9746 Reply to #9735

Subject : RE: DEVICE DRIVER

Have you tried DRIVER.SYS that comes with MSDOS ???

.....

#9775 Reply to #9746

Subject : RE: DEVICE DRIVER

I think you will find that if you can just get the diskette formatted at 720 K you will be home. There are several formatters around that will do that for you. The one included in WindowDOS does it. Also, getting a new ROM for you machine can cure the problem. If you have DOS 3.2 or 3.3, the DRIVER.SYS referred to in message #9746 is a cure. If you don't have the DOS manual, you won't be able to figure out how to use this. §

COMPUTER SERVICES

Mainframe Performance Statistics

NAS/8083 Dual Processor Performance Statistics for April

CPU	SYSTEM	Scheduled Operating Hours	Planned Maintenance Hours	Planned Production Hours	Unplanned Maintenance Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP5	720	0.15	719.85	0.00	719.85	100.0%
ACAD	MUSIC/SP	720	31.84	688.16	2.04	686.12	99.7%
ACAD	MVS/JES2	720	0.80	719.20	0.00	719.20	100.0%
ACAD	COMPLETA	720	0.87	719.13	2.77	716.36	99.6%
ADMN	MVS/JES2	720	0.35	719.65	0.60	719.05	99.9%
ADMN	COMPLETA	248	0.00	248.00	0.00	248.00	100.0%
ADMN	ADABASA	720	33.12	685.90	0.98	685.90	99.9%

System Uptime = (Production Hours Achieved) / (Planned Production Hours)

Production Hours Achieved = (Planned Production) – (Unplanned Maintenance)

Scheduled Operating Hours = (Planned Maintenance) + (Planned-Production)

MUSIC/SP Planned Maintenance Hours include 20.07 hours for system backup and 11.49 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 32.64 hours for system backup.

The ACAD CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime. The ADMN CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the key causes appearing in the table below.

ACAD CPU:

Miscellaneous

1. COMPLETA system maintenance.		2.77 HOURS
2. Undetermined cause for systems restarts.		1.39
3. Reset CPU clock to daylight savings time.		0.87
4. MUSIC daily backup failure.		0.65
5. COMPLETA system failure.		0.15
	TOTAL	5.83 HOURS

ADMN CPU:

Miscellaneous

1. Systems development.		0.98 HOURS
2 Reset CPU clock to daylight savings time.		1.32
	TOTAL:	1.46 HOURS

DISK BACKUP SCHEDULES

OS/MVS Backup Schedule

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m.

VM/CMS

Backups of VM system disks and CMS mini-disks are performed every Wednesday morning at 3 a.m. CMS mini-disks are also backed up every day sometime during the early hours of the morning. Users do not have to log-off during these backups.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form **MUSIC SHUT DOWN AT xxxx AM-SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC/SP, enter **HELP HOURS**. The following backup schedule is currently in effect:

Tuesday 3 a.m. (for about 3 hours)
Weekly backup

Wednesday 3 a.m. (for about 2 hours)
Daily backup

Thursday-Monday 4 a.m. (for about 1 hour)
Daily backup

PHOENIX Backup Hours

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of the VAXcluster are performed Monday through Thursday at 6 p.m. Users do not have to log-off, but any files that are open at the time of the backup will **NOT** be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done once a month. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shutdown for this. Watch the system log-on message for specific times and dates.

NOTE: Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done.§

ACADemic (NAS) Program Hit Parade

April Top Ten Programs : Frequency Of Runs

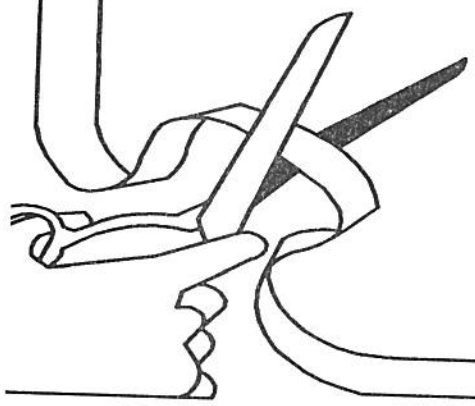
	Program	Description	Number of Runs	Percent of Total
1.	IEWL	Linkage Editor	29892	18.3
2.	PGM=*.DD	Compiled Program	29276	17.9
3.	IKFCBL00	VS COBOL Compiler	22332	13.7
4.	IEBPTPCH	IBM List Utility	16447	10.1
5.	IEV90	Assembler H	11494	7.0
6.	IEBGENER	IBM Utility	10844	6.6
7.	SASLPA	SAS	7264	4.4
8.	CASMA001	Sort Utility	6925	4.2
9.	PTPCH	Dataset Lister	5544	3.4
10.	ADARUN	ADABAS Utility Module	5366	3.3

AprilTop Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	Percent of Total
1. SASLPA	SAS	58860	31.0
2. PGM=*.DD	Compiled Program	41268	21.7
3. IKFCBL00	VS COBOL Compiler	24814	13.1
4. IEV90	Assembler H	8103	4.3
5. SPSSX	SPSS^X	7613	4.0
6. PTPCH	Dataset Lister	7244	3.8
7. IEWL	Linkage Editor	5990	3.2
8. ADARUN	ADABAS Utility Module	5796	3.1
9. SCRIPT	Waterloo/SCRIPT	4209	2.2
10. IEBPTPCH	IBM List Utility	3956	2.1

The programs listed in this section were used the most frequently on the NAS CPU during the month of April, 1989.

Please Note that ACAD is the official designation of the part of the NAS/8083 CPU that is dedicated to faculty and student use. The portion of the computer reserved for University administrative purposes is termed ADMN.§



NEW CMS SPOOL FILE POLICY

Starting July 15, 1989, a weekly procedure will be instituted to purge all CMS spool files older than seven days. Spool files are CMS virtual reader, punch, and printer files which have not been received to your minidisk, or transferred elsewhere. For example, CMS mail is received in the form of reader files. This action is necessary to be sure that enough spool space will continue to be available. If you have any questions about this new procedure, contact Academic Computing Services (817-565-2324, ISB 119).

University of North Texas Computing Center

Richard A. Harris, Associate Vice President for Computing
Steve Minnis, Director of Computing Technical Services
Dave Molta, Director of Academic Computing
Coy Hoggard, Director of Administrative Computing
Claudia Lynch, *Benchmarks* Editor
Philip Baczewski, *Benchmarks* Associate Editor

Computing Center Short Course Registration Form

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses listed below. You may also register over the phone by calling (817) 565-2324.

NAME:_____ PHONE:_____

DEPT:_____ CLASSIFICATION:_____

MAILING ADDRESS:_____

I wish to attend:

- **Introduction to JCL (ISB 123):**

  ___ Thursday, June 8: 3:30-5:30 p.m.

- **Introduction to SAS (ISB 110):**

  ___ Thursday, June 15: 6:30-8:30 p.m.

- **Introduction to SPSS-X (ISB 110):**

  ___ Monday, June 19: 3:30-5:30 p.m.

- **Introduction to PROCOMM (ISB 123):**

  ___ Wednesday, June 7: 3:30-4:30 p.m.

  ___ Thursday, July 13: 3:30-4:30 p.m.

- **Introduction to PCWS (ISB 123):**

  ___ Wednesday, June 7: 4:30-5:30 p.m.

  ___ Thursday, July 13: 4:30-5:30 p.m.

- **Introduction to BITNET (ISB 123):**

  ___ Tuesday, June 13: 3:30-5:30 p.m.

- **Introduction to ARPA Internet and THENET (ISB 123):**

  ___ Friday, June 16: 3-5 p.m.

  ___ Wednesday, July 12: 3:30-5:30 p.m.

- **Introduction to MUSIC/SP, Part II (ISB 110):**

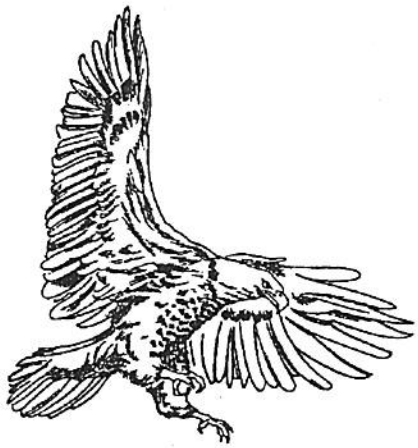
  ___ Friday, June 30: 3-5 p.m.

I would like to see more classes offered: ____ on weekends; ____at night.

The classes I am interested in

are:_____

_____



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Name:_____

Mailing Address:_____

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